

## ATTACHMENT 1

1. A gravimetric blender comprising:

- a. a vertically elongated housing having a transparent panel for operator viewing of blender operation within said housing;
- b. a material storage hopper removably mounted on said housing, comprising:
- i. means within the hopper and proximate the hopper bottom for selectively dispensing material within said hopper into said housing; and
  - ii. means connected to said hopper and remaining so upon removal of said hopper from said housing, for actuating said material dispensing means;
- c. a weigh bin connected to said housing below said hopper;
- d. means connected to the exterior of said housing for sensing weight of material in said bin; and
- e. a lower portion of said housing defining a mix chamber below said weigh bin.

2. The blender of claim 1 wherein said panel extends the vertical length of said housing.

3. The blender of claim 1 wherein said housing includes upwardly extending surfaces and said panel defines one of said surfaces.

4. The blender of claim 1 wherein said panel is removable.

5. The blender of claim 3 wherein said panel is removable.

6. The blender of claim 3 wherein a plurality of said vertically extending surfaces are formed integrally of a single piece.

7. The blender of claim 3 wherein said upwardly extending surfaces are vertically oriented.

8. The blender of claim 3 wherein said upwardly extending surfaces are planar.

9. A gravimetric blender comprising:

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- a. vertically elongated rectangular frame having a plurality of sides extending substantially the vertical height of said housing, one of said sides affording inspection and access to the housing throughout its height, said frame having a cradle at the top;
  - b. a material storage hopper removably mounted on said frame cradle and comprising means within said hopper and proximate the hopper bottom for dispensing material within said hopper;
  - c. a weigh bin positioned within said frame below said hopper;
  - d. means mounted in a load cell box connected to said frame laterally adjacent to said weigh bin for sensing weight of material in said bin by cantileveringly supporting said weigh bin; and
  - e. a mix chamber below said weigh bin.

10. The gravimetric blender of claim 9 wherein said means for dispensing material within said hopper includes a valve and means for actuating said valve, wherein said valve and said valve actuating means are fixedly connected to said hopper.

11. The blender of claim 10 wherein said actuating means is at least partially within said hopper.

12. The blender of claim 11 wherein said valve means is at least partially within said hopper.

13. The blender of claim 10 wherein said actuating means is fully within said hopper.

14. The blender of claim 11 wherein said valve means is fully within said hopper.

AH 15. The blender of claim 9, said frame having four sides with diverging guide flaps projecting upwardly from the top of said sides forming said cradle with an open-top, wherein said hopper with said valve and actuating means affixed thereto is seated in said cradle so as to be manually removable from said housing.

16. The blender of claim 9 further comprising a plurality of hoppers, each with valve means therewithin and respective individual valve actuation means. *see claim 10*

✓ 17. The blender of claim 16 wherein said <sup>valve actuation means claim 16</sup>actuating means is pneumatically driven and includes a vertically elongated member for transmitting motion to said valve. <sup>MA</sup> -ms

AS 18. The blender of claim 16 wherein said <sup>valve actuation</sup>actuating means comprises a piston-cylinder combination connected to said hopper wall. <sup>MA</sup>

19. The blender of claim 18 further comprising means connected to said frame for selectively contacting and opening said bin to release material in said bin downwardly into said mix chamber.

20. The blender of claim 19 further comprising an openable portion of said bin, and means to bias said portion to a closed position.

21. The blender of claim 20 wherein said openable portion is movable about a pivot.

✓ 22. The blender of claim 21 wherein said openable portion pivots about a horizontal axis.

23. The blender of claim 19 wherein said means for selectively contacting and opening said bin is pneumatically actuated.

24. The blender of claim 19 wherein said means for selectively contacting and opening said bin is a piston-cylinder combination.

- ✓ 25. The blender of claim 24 wherein said cylinder is outboard of said housing. <sup>MA</sup>
26. The blender of claim 24 wherein said piston moves transversely to the axis about which  
✓ <sup>MA</sup> said openable portion pivots.
27. The blender of claim 20 wherein said bin openable portion has an <sup>bin</sup> operator to pivot said  
^ <sup>see claim 28</sup> portion away from said closed position.
28. The blender of claim 27 wherein said piston contacts said bin operator.
29. The blender of claim 20 wherein said openable portion is pivotally connected to a remaining, stationary portion of said bin.
30. The blender of claim 9 wherein said frame is a single piece of material.
31. The blender of claim 30 wherein said frame is steel.
32. The blender of claim 30 wherein said frame has three sides, two of which are parallel and perpendicular to the remaining side.
33. The blender of claim 30 wherein said frame extends vertically upwardly in a straight line from the bottom of said blender to said hopper.
34. The blender of claim 30 wherein one side of said frame is open.
35. The blender of claim 30 further comprising an upwardly extending removable panel adapted for fitting together with said frame to provide an enclosure for said weigh bin.
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36. A gravimetric blender comprising:
- a. a housing;
- b. a weigh bin mounted on said housing, having an aperture at the bottom thereof and comprising;
- i. a movable weigh pan defining a portion of the bin bottom;

- ii. a sloped section forming a portion of said bin bottom and extending downwardly from a bin side;
  - iii. remaining sides of said bin having co-planar lower extremities;
  - iv. at least a central part of said pan when said aperture is open being below said sloped section;
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- c. means, connected to said housing, for sensing weight of material in said bin;
  - d. a mix chamber below said bin and connected to said housing including mixing means therein;
  - e. means for selectively moving said pan between a position covering said aperture at which said pan defines a portion of said bin bottom and an<sup>a</sup> position at which said aperture is open for releasing material in said bin downwardly into said mix chamber.
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37. The blender of claim 36 wherein said sloped section is planar.

38. The blender of claim 36 wherein said remaining sides of said bin are of common vertical height.

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39. The blender of claim 36 wherein said central part of said weigh bin pan when said pan is in said open aperture position is parallel with said sloped section.

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40. The blender of claim 36 wherein said central part of said weigh bin when at said open aperture position is under said sloped section.

41. A gravimetric blender comprising:

- a. a vertically elongated frame having an open side and defining an enclosure having a weigh bin and a mix chamber therein;

- b. a material storage hopper mounted on said frame;
- c. said weigh bin connected to said frame below said hopper;
- d. means, connected to said frame, for sensing weight of material in said bin as received from said hopper;
- e. said mix chamber below said bin and receiving material therefrom including rotatable mixing means therewithin;
- f. a vertically elongated panel adapted for connection with said frame to close said enclosure at the open side, and disconnection from said frame to open said enclosure, said panel being transparent;
- g. drive means supplying rotary motion for said mixing means; and
- h. means transferring rotary motion from said drive means to said mixer and operable to disconnect said mixing means from said drive means upon disconnection of said panel from said frame.

42. The blender of claim 41 wherein said means transferring rotary motion from said drive means to said mixing means connects said mixing means to said panel for axial movement of a shaft portion of said rotary motion transferring means unitarily with said panel upon panel disconnection from said frame.

43. The blender of claim 42 further comprising means for connecting said panel with said frame including a metal strap spanning across said open side along an exterior surface of said panel at a position in registry with said mix chamber.

44. The blender of claim 43 including clips between the strap and said frame releasably mounting said strap on said frame.

45. The blender of claim 44 wherein said strap is disposed on the outer side of said transparent panel, and retains said panel in place on said frame.

46. ~~The blender of claim 44 wherein said axis mixing means of rotary motion is perpendicular to said panel.~~

47. The blender of claim 44 further comprising drive means for supplying rotary motion to said mixing means through an arc.

48. The blender of claim 47 wherein said motion supplied by said drive means is a fixed arc.

49. The blender of claim 47 wherein said drive means reciprocates said mixing means through said arc in opposite directions.

50. The blender of claim 47 wherein said arc is less than a full circle.

51. The blender of claim 47 wherein said arc is greater than a full circle.

52. The blender of claim 47 wherein said drive means reciprocates said mixing means through arcs which are less than full circles.

53. The blender of claim 47 wherein said drive means is pneumatically driven.